

Species boundaries among barred river frogs, *Mixophyes* (Anura: Myobatrachidae) in north-eastern Australia, with descriptions of two new species

MICHAEL MAHONY¹, STEPHEN C. DONNELLAN^{2,3,7}, STEPHEN J. RICHARDS^{4,6} & KEITH MCDONALD⁵

¹Department of Biological Sciences, The University of Newcastle, Newcastle, Australia, 2308

²Evolutionary Biology Unit, The South Australian Museum, North Terrace, Adelaide, Australia, 5000

³Centre for Evolutionary Biology and Biodiversity, University of Adelaide, Adelaide, Australia, 5000

⁴Department of Zoology, James Cook University, Townsville, Queensland, Australia, 4811

⁵Queensland Department of Environment and Heritage, Wet Tropics District Office, P.O. Box 834, Atherton, Australia, 4883

⁶Present Address: Vertebrates Department, South Australian Museum, North Terrace, Adelaide, Australia, 5000

Abstract

Mixophyes are large ground-dwelling myobatrachid frogs from eastern Australia and New Guinea. We use analyses of allozyme frequencies, nucleotide sequences of mitochondrial DNA and morphology to define species boundaries in *Mixophyes* from the Wet Tropics World Heritage Area of northern Queensland. The molecular analyses identify a minimum of three species in the region. Morphometric and meristic analyses corroborate these distinctions. The existence of two of these species was not previously suspected, and they are formally described herein.

Key words: allozyme electrophoresis; Anura; *Mixophyes*; morphology; species boundaries

Introduction

The Wet Tropics World Heritage Area (WTWHA) in northern Queensland encompasses Australia's largest remaining stand of tropical rainforest. Recent molecular genetic studies of the evolutionary history of vertebrates from the WTWHA have revealed geographic patterns of genetic divergence consistent with areas identified as historical refugia by paleoclimatological modelling (Schneider *et al.* 1998). These divergences, which appear to be long standing and date to the Plio-Pleistocene, are taxonomically widespread and have been observed in frogs, lizards, and marsupials. Geographic isolation, due to